

# UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 84508  
CSAH NO. 30  
OVER THE  
RED RIVER OF THE NORTH  
DISTRICT 4 - WILKIN COUNTY

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PREPARED FOR THE  
MINNESOTA DEPARTMENT OF TRANSPORTATION  
BY  
COLLINS ENGINEERS, INC.  
JOB NO. 5221 (CEI 55)

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 84508, Piers 1 and 2 were found to be in good condition with no significant structural defects observed. Pier 2 was out of the water during the previous inspection, but it was in the water at the time of current inspection. The channel bottom appeared stable with no significant scour and with no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) There was a 2 foot diameter log located along the upstream nose of Pier 1 extending from the West face to the West shoreline.
- (B) Erosion was observed at the embankment along the West Abutment which was beginning to undermine the pile cap.
- (C) Steel I-beams with scattered debris hung up within them were observed extending from the channel bottom to 7 feet above the waterline, along the West face of Pier 1 to the shoreline. There was also a 2-foot-diameter log across the upstream nose of Pier 1.

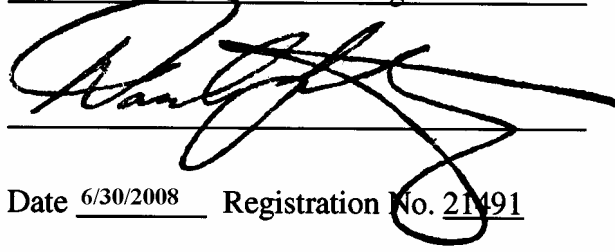
RECOMMENDATIONS:

- (A) Monitor the timber debris, and if found to be increasing in the future, removal operations may become warranted.
- (B) Evaluate the bank erosion and assess the need to provide riprap along the West Abutment to prevent further erosion.

- (C) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

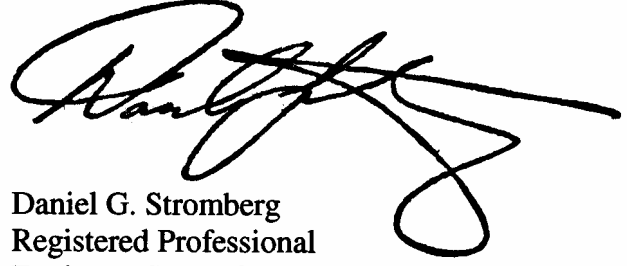
Daniel G. Stromberg

A large, stylized handwritten signature in black ink, appearing to read 'Daniel G. Stromberg', is written over two horizontal lines.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

A large, stylized handwritten signature in black ink, appearing to read 'Daniel G. Stromberg', is written over two horizontal lines.

Daniel G. Stromberg  
Registered Professional  
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 84508

Feature Crossed: The Red River of the North

Feature Carried: CSAH No. 30

Location: District 4 - Wilkin County

Bridge Description: The superstructure consists of three spans of multiple steel beams. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The footings of both the abutments and piers are supported by steel H-piles. The piers are numbered 1 and 2 starting from the west.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John Loftus, Valerie Roustan

Date: August 21, 2007

Weather Conditions: Cloudy,  $\pm 70$  °F

Underwater Visibility: Negligible/None

Waterway Velocity:  $\pm 1.5$  fps

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: The piers each consist of a rectangular shaft with rounded ends and a hammerhead cap founded on a rectangular footing supported by piles.

Maximum Water Depth at Substructure Inspected: Approximately 6.5 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the south end of Pier 1.

Water Surface: The waterline was approximately 21.2 feet below reference.  
Waterline Elevation = 897.4

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 8

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code R/95

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

       Yes   X   No



Photograph 1. Overall View of the Structure, Looking Northwest.



Photograph 2. View of Pier 1, Looking Southeast. Note I-beams Protruding from the Waterline.



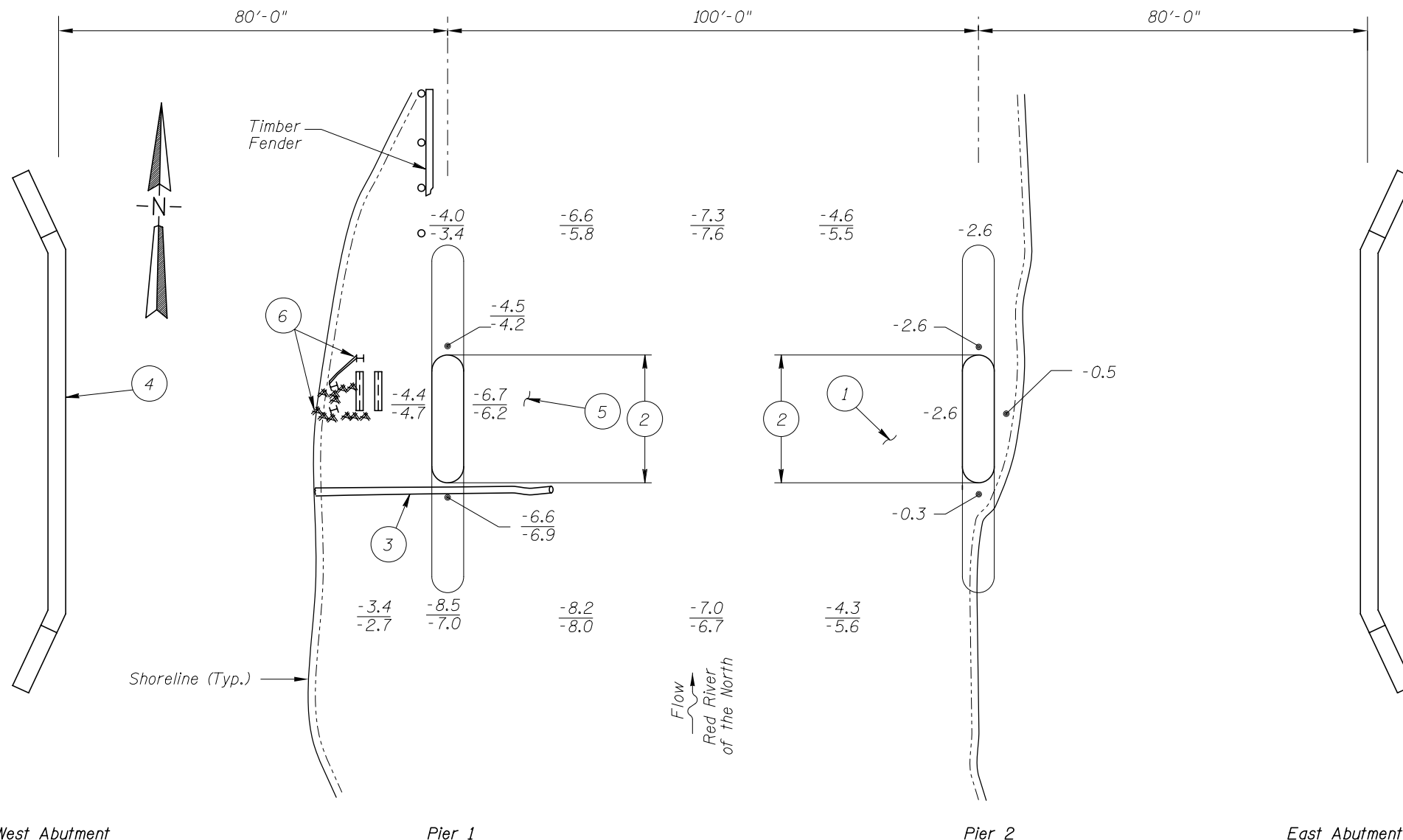
Photograph 3. View of Pier 2, Looking East.



Photograph 4. View of I-Beam debris between Pier 1 and the shoreline looking Southeast.



Photograph 5. View of West Abutment, Looking Southwest.

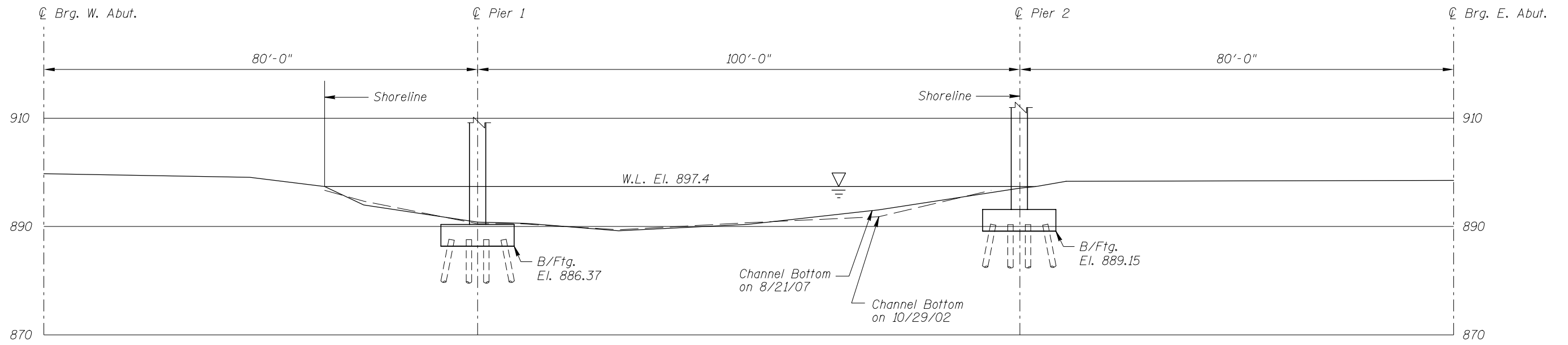


| Legend |                           |
|--------|---------------------------|
| -2.0   | Sounding Depth (8/16/07)  |
| -5.2   | Sounding Depth (10/29/02) |
|        | Timber Debris             |

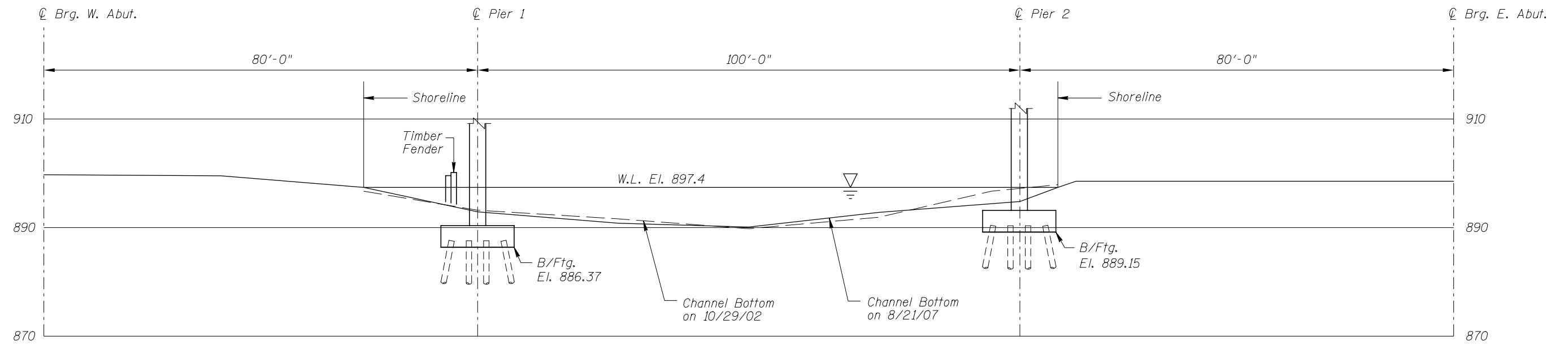
**Note:**

All soundings based on 2007 waterline location.

| MINNESOTA<br>DEPARTMENT OF TRANSPORTATION<br>UNDERWATER BRIDGE INSPECTION           |  |                    |
|---|--|--------------------|
| STRUCTURE NO. 84508<br>OVER THE RED RIVER OF THE NORTH<br>DISTRICT 4, WILKIN COUNTY |  |                    |
| INSPECTION AND SOUNDING PLAN  |  |                    |
| Drawn By: PRH   | <b>COLLINS ENGINEERS</b><br><small>123 North Wacker Drive<br/>Suite 300<br/>Chicago, IL 60606<br/>(312) 704-9300<br/>www.collinsengr.com</small> | Date: AUGUST, 2007 |
| Checked By: MDK   |  | Scale: NTS         |
| Code: 52210055  |  | Figure No.: 1      |



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:  
Refer to Figure 1 for General Notes.

| MINNESOTA<br>DEPARTMENT OF TRANSPORTATION<br>UNDERWATER BRIDGE INSPECTION           |  |                    |
|---|--|--------------------|
| STRUCTURE NO. 84508<br>OVER THE RED RIVER OF THE NORTH<br>DISTRICT 4, WILKIN COUNTY |  |                    |
| UPSTREAM AND DOWNSTREAM<br>FASCIA PROFILES  |  |                    |
| Drawn By: PRH   | <b>COLLINS ENGINEERS</b><br><small>123 North Wacker Drive<br/>Suite 300<br/>Chicago, IL 60606<br/>(312) 704-9300<br/>www.collinsengr.com</small> | Date: AUGUST, 2007 |
| Checked By: MDK   |  | Scale: 1"=20'      |
| Code: 52210055  |  | Figure No.: 2      |

MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES  
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 21, 2007

ON-SITE TEAM LEADER: Bradley A. Syler

BRIDGE NO: 84508 WEATHER: Cloudy,  $\pm 70^{\circ}\text{F}$

WATERWAY CROSSED: The Red River of the North

DIVING OPERATION: X SCUBA          SURFACE SUPPLIED AIR  
OTHER                                 

PERSONNEL: John Loftus, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 11:15 A.M.

TIME OUT OF WATER: 11:30 A.M.

WATERWAY DATA: VELOCITY  $\pm 1.5$  fps

VISIBILITY Negligible/None

DEPTH 8.5 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: The concrete of the piers was smooth and sound. There was a 2 foot diameter log along the upstream nose of Pier 1 which extended to the West shoreline. Steel I-beams were observed along the West face of Pier 1 with scattered debris hung up within the I-beams. Pier 2 was observed to be in the water, unlike the last inspection, and the channel bottom around the pier consisted of silt. Erosion was observed at the West Abutment which was beginning to undermine the pile cap.

FURTHER ACTION NEEDED:     X     YES          NO

Monitor the timber debris, and if found to be increasing in the future, removal operations may become warranted.

Evaluate the bank erosion and assess the need to provide riprap along the West Abutment to prevent further erosion.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 84508  
INSPECTORS Collins Engineers, Inc.  
ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.  
WATERWAY CROSSED The Red River of the North

INSPECTION DATE August 21, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

| UNIT REFERENCE NO. | UNIT DESCRIPTION | MAXIMUM DEPTH OF WATER | SUBSTRUCTURE |                            |          |              |       |                                      | CHANNEL |                    |                       |                      |  | GENERAL  |       |        |                 |                                |       |
|--------------------|------------------|------------------------|--------------|----------------------------|----------|--------------|-------|--------------------------------------|---------|--------------------|-----------------------|----------------------|--|----------|-------|--------|-----------------|--------------------------------|-------|
|                    |                  |                        | PILING       | COLUMNS, SHAFTS, OR FACES* | FOOTINGS | DISPLACEMENT | OTHER | OVERALL SUBSTRUCTURE CONDITION CODE* | SCOUR   | EMBANKMENT EROSION | EMBANKMENT PROTECTION | OTHER (DRIFT/DEBRIS) | OVERALL CHANNEL & PROTECTION CONDITION | CONCRETE | STEEL | TIMBER | LOSS OF SECTION | PREVIOUS REPAIR OR MAINTENANCE | OTHER |
|                    |                  | 1                      | 2            | 3                          | 4        | 5            | 6     | 7                                    | 8       | 9                  | 10                    | 11                   | 12                                     | 13       | 14    | 15     | 16              | 17                             | 18    |
|                    | Pier 1           | 8.5'                   | N            | 8                          | N        | 9            | N     | 8                                    | 7       | 6                  | N                     | 6                    | 6                                      | 8        | N     | N      | N               | N                              | N     |
|                    | Pier 2           | 2.6'                   | N            | 8                          | N        | 9            | N     | 8                                    | 7       | 6                  | N                     | N                    | 6                                      | 8        | N     | N      | N               | N                              | N     |
|                    |                  |                        |              |                            |          |              |       |                                      |         |                    |                       |                      |  |          |       |        |                 |                                |       |
|                    |                  |                        |              |                            |          |              |       |                                      |         |                    |                       |                      |  |          |       |        |                 |                                |       |

\*UNDERWATER PORTION ONLY

REMARKS: The concrete of the piers was smooth and sound. There was a 2 foot diameter log along the upstream nose of Pier 1 which extended to the West shoreline. Steel I-beams were observed along the West face of Pier 1 with scattered debris hung up within the I-beams. Pier 2 was observed to be in the water, unlike the last inspection, and the channel bottom around the pier consisted of silt. Erosion was observed at the West Abutment which was beginning to undermine the pile cap.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.  
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.